

## REMARKS / ARGUMENTS

### Status of Claims

Claims 1-57 are pending in the application and stand rejected. Claims 54, 56 and 57 were previously canceled. Applicant has further canceled Claims 5, 23-27, 35-36, 49 and 52, and has amended Claims 1, 6, 13, 14, 34, 37 and 47, leaving Claims 1-4, 6-22, 28-34, 37-48, 50-51, 53 and 55, for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, that no new matter has been entered, and that the application is in condition for allowance.

These amendments and accompanying remarks were not presented earlier because Applicant did not fully appreciate the nature of the Examiner's position until the Applicant was advised in more detail of the position by the final rejection, which introduced new grounds of rejection. The claim amendments presented herein, which Applicant respectfully requests entry thereof, should require only a cursory review by the Examiner as they include only elements presented in earlier examined claims. Accordingly, such amendments should not require further consideration or search.

### Claim Rejections under 35 U.S.C. §102(b)

Claims 1, 5-8, 13-15, 17, 18, 23, 34, 35, 42, and 45 stand rejected under 35 U.S.C. 102(b) as being anticipated by Giger et al. (U.S. Patent No. 6,205,348, hereinafter Giger).

Applicants traverse these rejections for the following reasons.

Applicants respectfully submit that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, *in a single prior art reference.*" *Verdegaal Bros. V. Unton Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the \*\*\* claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, the single source must disclose all of the claimed elements "*arranged as in the claim.*" *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984) (emphasis added). Missing elements may not be supplied by the knowledge of one skilled

in the art or the disclosure of another reference. Titanium Metals Corp. v. Banner, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

Regarding Claims 1, 5-8, 13-15, 17 and 18

Applicant has canceled Claim 5, and has incorporated all of the limitations of Claim 5 into Claim 1. Dependent claims inherit all of the limitations of the parent claim.

Accordingly, Claim 1 now recites, inter alia,

*"...employing a feature selection algorithm on the region of interest and classifying the region of interest..."*

In rejecting Claim 5, the Examiner remarks that Giger discloses a feature selection algorithm arranged as claimed, and cites Giger at Figure 28 and at column 10, lines 35-38 (referring to an artificial neural network, ANN) in support thereof. Paper 11282005, page 4.

Applicant respectfully disagrees that the Giger ANN is *a feature selection algorithm* arranged as claimed.

At Column 11, lines 39-45, Giger specifically states that "*ANN is a non-algorithmic approach to information processing. Unlike many artificial intelligence techniques, which require extensive knowledge of the many parameters involved, ANNs learn directly from examples that are provided repeatedly. Once trained, a neural network can distinguish among input patterns on the basis of its learning experience."*

Accordingly, and contrary to the Examiner's allegation, Applicant finds Giger to specifically state that the Giger ANN is *not algorithmic*, and therefore Giger absolutely cannot disclose *a feature selection algorithm* arranged as claimed.

Accordingly, Applicant submits that Giger does not disclose all of the claimed elements arranged as claimed, and absent anticipatory disclosure in Giger of each and every element of the claimed invention arranged as claimed, Giger cannot be anticipatory.

Regarding Claim 23

Applicant has canceled Claim 23, thereby obviating this rejection.

Regarding Claims 34, 35, 42 and 45

Applicant has canceled Claims 35 and 36, and has incorporated all of the limitations of Claims 35 and 36 into Claim 34. Dependent claims inherit all of the limitations of the parent claim.

Accordingly, Claim 34 now recites, inter alia,

"...classifying an identified candidate region using a computer aided *rule based approach*, wherein different rules apply for calcifications, metastases, erosions, and fractures, and for different types of fractures and different properties of metastases."

In alleging anticipation, the Examiner did not reject Claim 36 under 35 U.S.C. §102(b) as being anticipated by Giger.

Accordingly, Applicant submits that Giger does not disclose all of the claimed elements arranged as claimed, and absent anticipatory disclosure in Giger of each and every element of the claimed invention arranged as claimed, Giger cannot be anticipatory.

In view of the amendment and foregoing remarks, Applicant submits that Giger does not disclose each and every element of the claimed invention arranged as claimed and therefore cannot be anticipatory. Accordingly, Applicant respectfully submits that the Examiner's rejection under 35 U.S.C. §102(b) has been traversed, and requests that the Examiner reconsider and withdraw of this rejection.

**Claim Rejections under 35 U.S.C. §103(a)**

**Group I:** Claims 2-4, 16, 19, 20, 24-27, 29-32 and 52, 53 and 55 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Giger.

**Group II:** Claims 9-12, 21, 22, 28, 33, 36-41, 43, 44, and 46 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Giger in view of Nishikawa et al. (U.S. Patent No. 6,058,322, hereinafter Nishikawa).

**Group III:** Claims 47-51 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikawa in view of Giger.

Applicant traverses these rejections for the following reasons.

Applicants respectfully submit that the obviousness rejection based on the References is improper as the References fail to teach or suggest *each and every element of the instant invention arranged to perform as the claimed invention performs*. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are taught or suggested in the prior art. MPEP §2143.03.

**Group I:****Regarding Claims 2-4, 16, 19 and 20**

Claims 2-4, 16, 19 and 20 depend directly from Claim 1, which has been amended as set forth above. In alleging obviousness, the Examiner applies Giger absent a second reference.

In view of the remarks set forth above, Applicant submits that Giger is deficient in its teaching of each and every element of Claim 1, and therefore cannot properly be applied to establish a prima facie case of obviousness against claims dependent from Claim 1.

Accordingly, Applicant submits that Claims 2-4, 16, 19 and 20 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.

**Regarding Claims 24-27**

Applicant has canceled Claims 24-27, thereby obviating this rejection.

**Regarding Claims 29-32**

Claims 29-32 depend either directly or indirectly from Claim 28, which recites, inter alia, "...employing a *feature selection algorithm* on the set of feature measures and identifying an optimal set of features..."

As set forth above (regarding the allowability of Claim 1), Applicant submits that Giger teaches a *non-algorithmic approach to information processing*, and is therefore absent any disclosure or teaching of a *feature selection algorithm*.

In view of the remarks set forth above, Applicant submits that Giger is deficient in its teaching of each and every element of Claim 28, and therefore cannot properly be applied to establish a prima facie case of obviousness against claims dependent from Claim 28.

Accordingly, Applicant submits that Claims 29-32 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.

**Regarding Claims 52**

Applicant has canceled Claim 52, thereby obviating this rejection.

**Regarding Claims 53 and 55**

Claims 53 and 55 recite, inter alia,

"...*the first energy images, second energy images, first decomposed images, and second decomposed images forming the image set;*  
employing a data source, *the data source including the image set...*"

As claimed, the invention requires the presence of *four different types of images to be included in the image set*, and requires *a data source to include the image set*, which includes the four different types of images.

In comparing Giger with the claimed invention, Applicant finds Giger to teach a high energy image and a low energy image (column 7, line 44), and to teach a bone-cancelled image and a soft-tissue cancelled image (column 7, lines 50-51). However, in respectful disagreement with the Examiner, Applicant finds Giger to teach *an energy subtraction technique that yields the bone-cancelled image and the soft-tissue cancelled image* (column 7, lines 50-51), and not to teach *a data source including the image set that includes four different types of images (first energy images, second energy images, first decomposed images, and second decomposed images)*.

Accordingly, Applicant submits that Giger offers no teaching or suggestion of each and every element of the claimed invention arranged so as to perform as the claimed invention performs.

In alleging obviousness, the Examiner remarks that because Giger discloses producing a high-energy image, low-energy image, "bone-cancelled" image, and "soft-tissue-cancelled" image, Giger therefore discloses each and every element of the claimed invention. Paper 11282005, page 2.

Applicant respectfully disagrees with this conclusion. For an obviousness rejection to stand, it is not enough to merely show each and every element of the claimed invention. Rather, each and every element of the claimed invention must be shown so as to perform as the claimed invention performs, and there must be some expectation of success in combining the claimed elements to perform as the claimed invention performs.

Here, the claimed invention performs by *employing a data source, the data source including the image set*.

In comparing Giger with the claimed invention, Applicant finds no teaching or suggestion of *employing a data source, the data source including the image set*, and the Examiner has not stated with specificity where Giger teaches or suggests such claim limitations.

Absent a teaching or suggestion of each and every element of the claimed invention arranged so as to perform as the claimed invention performs, Applicant submits that a prima facie case of obviousness cannot be established.

**Group II:****Regarding Claims 9-12, 21 and 22**

Claims 9-12, 21 and 22 depend either directly or indirectly from Claim 1, which has been amended as set forth above. Dependent claims inherit all of the limitations of the parent claim. In alleging obviousness, the Examiner applies Giger in combination with Nishikawa.

In view of the remarks set forth above, Applicant submits that Giger is deficient in its teaching of each and every element of Claim 1, and further submits that Nishikawa fails to cure this deficiency. More specifically, Applicant submits that the combination of Giger and Nishikawa fails to teach or suggest “...*employing a feature selection algorithm on the region of interest and classifying the region of interest...*”, and therefore cannot properly be applied to establish a prima facie case of obviousness against claims dependent from Claim 1.

Accordingly, Applicant submits that Claims 9-12, 21 and 22 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.

**Regarding Claim 28**

Claim 28 recites, inter alia,

“...*employing a feature selection algorithm on the set of feature measures and identifying an optimal set of features...*”

As set forth above (regarding the allowability of Claim 1), Applicant submits that Giger teaches a *non-algorithmic approach to information processing*, and is therefore absent any disclosure or teaching of a *feature selection algorithm*. Furthermore, Applicant submits that Nishikawa fails to cure this deficiency.

In view of the remarks set forth above, Applicant submits that Giger is deficient in its teaching of each and every element of Claim 28, and that Nishikawa fails to cure this deficiency. More specifically, Applicant submits that the combination of Giger and Nishikawa fails to teach or suggest “...*employing a feature selection algorithm on the set of feature measures and identifying an optimal set of features...*”, and therefore cannot properly be applied to establish a prima facie case of obviousness against Claim 28.

Accordingly, Applicant submits that Claim 28 is directed to allowable subject matter, and respectfully requests notice of allowance thereof.

**Regarding Claim 33**

Claim 33 recites, inter alia,

***“...employing a data source, the data source including a dual or multiple energy image set having a first decomposed image, a second decomposed image, a high energy image, and a low energy image;***

...

***employing a feature selection algorithm on the feature measures for identifying an optimal set of features.”***

As set forth above (regarding Claims 53 and 55), Applicant finds Giger to be absent any teaching or suggestion of ***employing a data source, the data source including a dual or multiple energy image set having a first decomposed image, a second decomposed image, a high energy image, and a low energy image.***

As also set forth above (regarding Claim 1), Applicant finds Giger to be absent any teaching or suggestion of employing a feature selection algorithm.

Additionally, Applicant submits that Nishikawa fails to cure these deficiencies of Giger.

In view of the remarks set forth above, Applicant submits that Giger is deficient in its teaching of each and every element of Claim 33, and that Nishikawa fails to cure these deficiencies, and therefore the combination of Giger and Nishikawa cannot properly be applied to establish a prima facie case of obviousness against Claim 33.

Accordingly, Applicant submits that Claim 33 is directed to allowable subject matter, and respectfully requests notice of allowance thereof.

**Regarding Claims 36-41, 43, 44 and 46**

Claims 36-41, 43, 44 and 46 depend either directly or indirectly from Claim 34, which has been amended as set forth above to now recite, inter alia,

***“...employing a data source, the data source including a dual or multiple energy image set, the image set comprising a high energy image, a low energy image, a bone image, and a soft tissue image;***

...

***classifying an identified candidate region using a computer aided rule based approach, wherein different rules apply for calcifications, metastases, erosions, and fractures, and for different types of fractures and different properties of metastases.”***

Dependent claims inherit all of the limitations of the parent claim.

For at least the reasons set forth above regarding the claimed *data source including four different types of images* (different from *an energy subtraction technique that yields the bone-cancelled image and the soft-tissue cancelled image*), and the claimed *rule based approach* to information processing (different from *a non-algorithmic approach to information processing*), Applicant submits that Giger is deficient in its teaching of each and every element of Claim 34, and further submits that Nishikawa fails to cure these deficiencies, and therefore the combination of Giger and Nishikawa cannot properly be applied to establish a prima facie case of obviousness against Claims 36-41, 43, 44 and 46.

Accordingly, Applicant submits that Claims 36-41, 43, 44 and 46 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.

**Group III:**

**Regarding Claims 47-51**

Claim 47 has been amended to now recite, inter alia,

**"...employing a data source, *the data source including a dual or multiple energy image set, the image set comprising a high energy image, a low energy image, a bone image, and a soft tissue image;***

...

classifying the region of interest in the soft-tissue image as a candidate for soft-tissue disease utilizing the features extracted from the bone image, the classifying comprising using a computer aided **rule based approach, wherein different rules apply for** different medical conditions, and different rules are used for the soft-tissue and bone-images."

Dependent claims inherit all of the limitations of the parent claim.

For at least the reasons set forth above regarding the claimed *data source including four different types of images* (different from *an energy subtraction technique that yields the bone-cancelled image and the soft-tissue cancelled image*), and the claimed *rule based approach* to information processing (different from *a non-algorithmic approach to information processing*), Applicant submits that the combination of Nishikawa and Giger are deficient in their teaching of each and every element of Claim 47, and therefore the combination cannot properly be applied to establish a prima facie case of obviousness against Claims 47-51.

Accordingly, Applicant submits that Claims 47-51 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.



In view of the foregoing, Applicant submits that the References fail to teach or suggest each and every element of the claimed invention and are therefore wholly inadequate in their teaching of the claimed invention as a whole, fail to motivate one skilled in the art to do what the patent Applicant has done, fail to offer any reasonable expectation of success in combining the References to perform as the claimed invention performs, and discloses a substantially different invention from the claimed invention, and therefore cannot properly be used to establish a prima facie case of obviousness. Accordingly, Applicant respectfully requests reconsideration and withdrawal of all rejections under 35 U.S.C. §103(a), which Applicant considers to be traversed.

Applicant has amended the claims for presentation in better form for consideration on appeal. The claim amendments should only require a cursory review by the Examiner as they only include language presented in earlier examined claims.

In light of the foregoing remarks and amendments, Applicant respectfully submits that the proposed amendments and arguments comply with 37 C.F.R. §1.116 and should therefore be entered, and with their entry that the Examiner's rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, and that the application is now in condition for allowance. Such action is therefore respectfully requested.

The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above identified Deposit Account.

Respectfully submitted,

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